



Review

Public Health Policy of India and COVID-19: Diagnosis and Prognosis of the Combating Response

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Abstract: (1) Background: Society and public policy have been remained interwoven since the inception of the modern state. Public health policy has been one of the important elements of the public administration of the Government of India (GOI). In order to universalize healthcare facilities for all, the GOI has formulated and implemented the national health policy (NHP). The latest NHP (2017) has been focused on the “Health in All” approach. On the other hand, the ongoing pandemic COVID-19 had left critical impacts on India’s health, healthcare system, and human security. The paper’s main focus is to critically examine the existing healthcare facilities and the GOI’s response to combat the COVID-19 apropos the NHP 2017. The paper suggests policy options that can be adopted to prevent the further expansion of the pandemic and prepare the country for future health emergency-like situations. (2) Methods: Extensive literature search was done in various databases, such as Scopus, Web of Science, Medline/PubMed, and google scholar search engines to gather relevant information in the Indian context. (3) Results: Notwithstanding the several combatting steps on a war-footing level, COVID-19 has placed an extra burden over the already overstretched healthcare infrastructure. Consequently, infected cases and deaths have been growing exponentially, making India stand in second place among the top ten COVID-19-infected countries. (4) Conclusions: India needs to expand the public healthcare system and enhance the expenditure as per the set goals in NHP-17 and WHO standards. The private healthcare system has not been proved reliable during the emergency. Only the public health system is suitable for the country wherein the population’s substantial size is rural and poor.

Keywords: COVID-19; national health policy; India; public health; Ayushman Bharat scheme; policy paradoxes; economics; health spending

1. Introduction

COVID-19 has raised many Indian public health policy questions in the backdrop of massive infected and death cases. COVID-19 can be characterized as a global health crisis that has had multilateral impacts on countries, including the health system. It is caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). Following a report of a cluster of cases of “viral pneumonia” in Wuhan (China), WHO first learned of this new virus on 31 December 2019 [1]. China had declared it a new type of novel coronavirus

(nCoV) on 7 January 2020, and the World Health Organization (WHO) renamed it COVID-19 on 11 February 2020. As on 25 December, WHO has confirmed 77,920,564 cases and 1,731,901 death cases worldwide [2]. COVID-19 is not the first outbreak of coronavirus; rather, the world had experienced a few other coronavirus outbreaks, such as the coronavirus with severe acute respiratory syndrome (SARS-CoV) and Middle East coronavirus respiratory syndrome (MERS-CoV), and India is no exception to the same [3].

Pandemics and civilizations have been moving concurrently since recorded history. It had already come across several endemics and pandemics, such as measles, cholera, dengue, smallpox, including the ongoing COVID-19. A brief history of epidemics and pandemics in India includes the cholera pandemic (1817–1899); the Bombay plague epidemic (1896), the influenza pandemic (1918), the polio epidemic (1970–1990), the smallpox epidemic (1974), the Surat plague epidemic (1994), the plague of northern India (2002), dengue epidemic (2003), the SARS epidemic (2003), meningococcal meningitis epidemic (2005), the Chikungunya outbreak (2006), the dengue outbreak (2006), the Gujarat jaundice epidemic (2009), the H1N1 flu pandemic (2009), the Odisha jaundice epidemic (2014), Indian swine flu (2015), Nipah (2018) [4], and the ongoing COVID-19 (2020) pandemic, as well [5]. Hence, to take care of its citizens' health issues and concerns, the GOI has formulated and implemented several public health policies (1983, 2002, and 2017). The main target of the latest national health policy (NHP) 2017 is to provide the universalization of healthcare with a "Health in All" approach, but COVID-19 has made the health situation critical, causing massive, infected cases deaths. Thus, the critical question is—has India's NHP provided sufficient infrastructure to deal with the ongoing pandemic? We know for sure that India's national health expenditure has been growing tremendously over the past decades in absolute terms [6]. Yet in percentage share of gross domestic product terms (% GDP), it stands firmly at approximately 4% level, which is far beyond growth trend in other globally leading emerging BRICS markets [7]. Thus, national infrastructure has undoubtedly passed a long way of capacity growth facing current momentum.

The highest number of positive cases of COVID-19 has been witnessed in the United States (US), followed by India [2]. Among other large nations, the corona case of Russia is essential for understanding the global dynamics of pandemic associated with human traffic. This vast country serves as the continental land bridge and flight route connecting East Asia and Europe [8]. The first case of COVID-19 in India was reported in Thrissur (Kerala) after a student who had returned home for a vacation from the Wuhan University of China. By March, India had witnessed a considerable rise in COVID-19 cases [9]. Realizing the gravity of the situation, the GOI had taken several combative measures, such as lockdown and social distancing, to prevent the spread of the COVID-19 pandemic. However, these measures had negatively impacted the socioeconomic well-being of people while positively affected the environment [10]. These measures have also posed major setbacks to the previous achievements of National health programs, especially for the people who belong to the low socioeconomic stratum [11]. In this background, this paper's primary focus is to critically examine the existing healthcare facilities and the GOI's response to combat the COVID-19 apropos the NHP 2017. Finally, to suggest possible policy options for India to deal with the ongoing epidemic and other future health emergencies.

2. Materials and Methods

In this paper, numerous articles were searched from various databases, such as Scopus, Web of Science, Medline/PubMed and google scholar search engines to gather relevant information in the Indian context. The keywords used were "COVID-19", "India's response", OR "Health Policy", OR "Lockdown", "Healthcare" to ensure the full coverage of some government documents. Annual reports on health information from the central bureau of health intelligence and reliable national newspapers were reviewed to document the various phases of the COVID-19 epidemic, including the lockdowns, public health challenges, mortality and morbidity data, the government of India's response, and various domestic challenges due to the pandemic. This review is primarily based on a secondary

source of data, and a descriptive analysis of data is provided to reflect the results. The significant findings and policy options are described in the following sections.

3. Results

3.1. National Health Policies of India: Lofty Dreams

Public health has been given an important place in Indian public policy. The health policies used to play vital roles in deciding how health issues and concerns would be taken care of. The health policies of the GOI had started soon after its independence and more precise with the establishment of the Bhore Committee Report in 1946 [12]. To provide the preventive and curative healthcare systems in rural and urban areas, the Bhore Committee made three important recommendations in a three-tiered model, such as a public healthcare system, healthcare workers on the government payroll, and emphasis on limiting the need for private practitioners.

The first NHP of India was formulated in 1983 to provide primary healthcare access for all Indian citizens by 2000 [13]. It is primarily based on the suggestions made by the Bhore Committee. It had prioritized the establishment of primary healthcare service networks by using the health volunteers and technology that has created well-functioning of referral networks and an integrated network of specialist facilities. However, since the mid-nineties, the private health sector has expanded rapidly. In the other scenario, the public health system has been reformed to suit the private model by implementing user charges and outsourcing of services [14].

The second NHP formulated in 2002 was further developed based on NHP 1983, with the goals of delivering health services to the general population through decentralization, the private sector's use, and the overall increase in public healthcare spending [15]. It also has emphasized the use of nonallopathic medicines, such as Ayurveda, Unani, Siddha and reinforce the decentralized decision-making processes by providing more autonomy to the states. The previous health policies have prioritized healthcare in five-year plans, but after implementing a considerable period of NHP 2002, health issues and concerns of people have been changed. Despite the rapid decline in maternal and child mortality, noncommunicable diseases and some infectious diseases have been consistently haunting society. There are large-scale spending cases due to the expensive healthcare system, which is currently projected as one of the major contributors to poverty in India. In addition, the improved health of the Indian economy has increased the fiscal capacity of the GOI to increase its spending on the health sector [16]. In this background, a new health policy is direly needed to fit in with the emerging health issues and challenges. Hence, by considering the prevailing internal and external scenarios, the GOI had restructured and conceptualized its health policy—NHP 2017.

3.2. The National Health Policy 2017: “Health in All” Approach

The latest NHP 2017 is based on the principles of universality, affordability, equity, patient-centered and quality care, inclusive partnership, pluralism, decentralization, and dynamism based on the WHO's “Health in All Policies” [17]. This policy's main objectives included reinforcing people's trust in the public healthcare system, aligning the private healthcare sector's growth with public health goals and the quantitative goals, and progressively achieving universal health coverage (UHC) [18]. To check the policy's successful implementation, set targets are to be achieved in a time-bound manner, such as an increase of life expectancy at birth from 67.5 to 70 by 2025; reduce under-five mortality to 23 by 2025; reduce the infant mortality rate to 28 by 2019. Under the NHP 2017, it is decided to achieve the global target of 2020, which is also termed as the target of 90:90:90; to ensure availability of paramedics and doctors in high priority districts by 2020; increase community health volunteers to population ratio in high priority districts by 2025. The most important highlight of the policy is Swasth Nagrik Abhiyan or “Health in All” approach to providing “assured healthcare for all at affordable cost” [19,20]. The NHP 2017 shows India's commitment to achieving the 3rd Sustainable Development Goal (SDG) of the United Nations, ensuring

healthy lives and promoting well-being for all [21]. Therefore, the primary goal of NHP 2017 is to attain the highest possible level of health and well-being for all via the preventive and promoting healthcare systems; and universalize the high-quality healthcare facilities to all irrespective of financial restraints [16]. The policy recommends a time-bound rise in public health spending to 2.5 percent of GDP. According to the former Health Minister of India, J.P. Nadda, the 2.5 percent of GDP spending targets for the health sector would be met by 2025 [16,19]. The articulation of goals, key policy principles, and objectives of NHP 2017 is in line with India's commitment towards universal health coverage (UHC).

Ayushman Bharat, a flagship scheme of the GOI, was launched as suggested by the national health policy of 2017 to achieve universal health coverage (UHC). This project was planned to achieve Sustainable Development Goals (SDGs) and its underlining pledge, which is to "leave no one behind" [22]. It is essentially designed to provide health insurance to the poor, lower sections of the society, and the vulnerable population. It is considered one of the world's biggest schemes as it aims to cover more than 50 crores (500 million) citizens. This scheme comprises two interrelated components—health and wellness centers (HWCs) and Pradhan Mantri Jan Arogya Yojana (PM-JAY). The HWCs aim to deliver comprehensive primary healthcare (CPHC) and provide free essential drugs and diagnostic services. The second component of the policy—PM-JAY aims to provide a health cover of Rs. 5 lakhs per family per year for secondary and tertiary care hospitalization across the public- and private-empaneled hospitals in India for 10.74 crores poor and vulnerable families. This policy's coverage becomes approximately 50 crores (500 million) beneficiaries, i.e., 40% of the Indian population.

The GOI fully funds PM-JAY, and the cost of implementation is shared between the central and state governments in the ratio of 60:40, for States (other than the North-Eastern States and three Himalayan States) and union territories with legislature [22]. This ambitious endeavor's feasibility largely depends on the central government's ability to provide filtering for cost-effective medical care technologies [23]. It has been proven that administration of stringent health technology assessment policies, particularly on high-budget impact interventions, such as innovative targeted pharmaceuticals, may induce substantial cost savings. These fiscal flows have been further used to fund a package of ground medical goods and services, typically essential medicines, and access to basic physician examinations and surgery in remote rural areas [24].

Given the urban-rural and inter-state disparities, inequality in healthcare access is still haunting the people including the sexual and reproductive health services [25]. Therefore, the NHP-2017 and Ayushman Bharat scheme are considered positive steps in bridging the gap and providing universal health facilities. However, the sudden emergence of the COVID-19 pandemic has created the testing ground for the implementation of NHP 2017. Given the COVID-19 prevailing scenario, the question has emerged; is the health infrastructure sufficient to meet the COVID-19 challenges apropos of NHP's (2017) "Health in All" approach? Subsequent parts of the paper have also examined would the current policy to deal with the ongoing pandemic?

3.3. COVID-19 in India: Present Scenario

The COVID-19 cases have spread in more than 200 countries/territories. India stood in second place among the top 10 countries. The comparative data of COVID-19 cases of the top five countries, including India, is shown in Table 1 below:

Table 1. Top five Countries in COVID-19 cases (as of 25 December 2020).

Country	Total Cases	Total Deaths	Total Recovered	Active Cases	Total Tests	Population
USA	19,111,326	337,066	11,219,123	7,555,137	242,068,492	331,939,197
India	10,147,468	147,128	9,717,834	282,506	166,305,762	1,386,530,639
Brazil	7,425,593	190,032	6,449,822	785,739	28,600,000	213,287,772
Russia	2,992,706	53,659	2,398,254	540,793	88,094,380	145,964,778
France	2,527,509	62,268	188,639	2,276,602	32,361,074	65,343,395

Source: reported cases, deaths, recovered cases, tests and population, Worldometer. <https://www.worldometers.info/coronavirus/> accessed on 25 December 2020.

According to the Ministry of Health and Family Welfare (MoHFW) of the GOI, the total cases, cured cases, and deaths in India have reached 10,146,845; 9,717,834; and 147,092, respectively reported as of 25 December 2020. The highest number of confirmed cases have appeared in Maharashtra (19,09,951), followed by Karnataka (913,483), Andhra Pradesh (880,075), and Tamil Nadu (811,115), respectively. The highest number of recoveries were shown in Maharashtra with 1,804,871 cases, followed by Karnataka (887,815) and Andhra Pradesh (869,124), whereas Lakshadweep has been in a safe zone, not having even a single case so far [26]. As of 25 December, India's fatality rate is less than 2 percent, and the recovery rate stood at more than 95 percent. The comparative data of COVID-19 cases in states of India are shown in Table 2 below:

Table 2. Distribution of COVID-19 cases in India by state.

State/Uts	Total Cases	Active Cases	Discharged	Deaths
Maharashtra	1,909,951	56,022	1,804,871	49,058
Karnataka	913,483	13,629	887,815	12,039
Andhra Pradesh	880,075	3862	869,124	7089
Tamil Nadu	811,115	9217	789,862	12,036
Kerala	726,687	63,328	660,445	2914
Delhi	620,681	7909	602,388	10,384
Uttar Pradesh	578,568	16,099	554,202	8267
West Bengal	543,214	15,193	518,516	9505
Odisha	327,542	2720	322,972	1850
Rajasthan	302,709	11,671	288,388	2650
Telangana	284,074	6839	275,708	1527
Chhattisgarh	272,426	15,153	254,024	3249
Haryana	259,745	4983	251,908	2854
Bihar	248,351	5434	241,546	1371
Gujarat	239,195	10,841	224,092	4262
Madhya Pradesh	235,369	10,676	221,169	3524
Assam	215,775	3456	211,286	1033
Punjab	164,505	4812	154,433	5260
Jammu and Kashmir	119,344	3540	113,944	1860
Jharkhand	113,786	1595	111,175	1016
Uttarakhand	88,376	5331	81,587	1458
Himachal Pradesh	53,766	4681	48,186	899
Goa	50,454	1001	48,725	728
Puducherry	37,885	364	36,892	629
Tripura	33,225	184	32,657	384
Manipur	27,876	1362	26,173	341
Chandigarh	19,309	361	18,634	314
Arunachal Pradesh	16,678	184	16,438	56
Meghalaya	13,340	283	12,922	135
Nagaland	11,890	305	11,508	77
Ladakh	9341	246	8969	126
Sikkim	5664	420	5119	125
Andaman and Nicobar	4901	64	4775	62
Mizoram	4178	146	4024	8
Dadra and Nagar Haveli and Daman and Diu	3367	8	3357	2
Lakshadweep	0	0	0	0

Source: The COVID-19 State-wise status on 25 December 2020. My Gov, GoI.

3.4. Health Infrastructures vs. COVID-19 Cases

The latest NHP 2017 had laid focus on “Health in All.” Healthcare expenditure is to be increased at the rate of 2.5% of GDP to expand the health infrastructures, such as doctors, paramedics, hospitals, research, and development, etc. Given the lofty ideals of the NHP, COVID-19 is the time to take a reality check as to how much the GOI is ready to translate the ideological objectives of NHP-2017 into reality? This section would focus on the diagnosis of the existing healthcare system, particularly in the context of prevailing COVID-19. The Center for Disease Dynamics, Economics and Policy (CDDEP) [27] and Princeton University have estimated the existing state-wise availability of hospital beds, intensive care units (ICUs), beds, and ventilators across India based on data available on the website of Central Bureau of Health Intelligence (CBHI) under title “National Health Profile 2019” [28]. According to CDDEP report published on (20 April 2020) and National Health Profile 2019, (i) the total hospitals in India are 69,265, i.e., (public hospitals—25,778 and private hospitals—43,487); (ii) the total hospital beds—1,899,228 (Public sector—7, 13,986; and Private sector—1,185,242); (iii) the total number of ICU beds—94,961 (Public sector—35,699 and Private sector 59,262); (iv) total ventilators—47,481 (public sector—17,850; private sector—29,631). As mentioned above, the data clearly shows that most of the healthcare facilities in India lie in the private sector. In India, the available government hospital beds and ICU beds are 0.51 and 0.025 per 1000 population, respectively; whereas, the available private hospital beds and ICU beds are 0.85 and 0.04 percent per 1000 population, respectively. The State-wise data of availability of public and private hospitals, hospital beds, ICU beds, and ventilators are listed below in Table 3.

Analysis—If the state-wise data of coronavirus cases (Table 2) and public health facilities (Table 3) are compared, it shows that Maharashtra (1,909,951) has most of the number of cases while having only 713,986 public hospital beds. According to WHO’s COVID-19 report, 5 percent of the total cases need ventilator support, and around 15 percent of total tested positive cases need hospital care (WHO, 2020) [29]. Thus, approximately 95,497 COVID-19-infected cases in Maharashtra needed ventilators, while the number of available ventilators is 5793, of which 4507 are in the private hospital. Similar critical situations were there in Andhra Pradesh, Tamil Nadu, Gujarat, Karnataka, Delhi, Telangana, Bihar, Punjab, Madhya Pradesh, Assam, Uttar Pradesh, Odisha, Haryana, Chhattisgarh, Goa, Puducherry, Tripura, Arunachal Pradesh, Manipur, and Jammu and Kashmir. Whereas the ratio of COVID-19-positive cases and health facilities is in better conditions in Sikkim, Mizoram, Dadra and Nagar Haveli, Andaman and Nicobar, Meghalaya Lakshadweep.

According to data mentioned in Table 3, the total number of public hospital beds, ICU beds, and ventilators in India are 713,986; 35,699; and 17,850, respectively, while the active COVID-19 cases have already crossed the one crore mark. On one hand, some states have good healthcare infrastructure, whereas some fell short in meeting the healthcare needs during emergencies. India had experienced a peak of COVID-19 cases in mid-September, and it is widely reported that healthcare infrastructures in states lack doctors, paramedics, ventilators, PPEs kits, gloves, medical suits, etc.

The graph mentioned in Figure 1 depicts that per day highest number of cases (101,854) of COVID-19 was reported on 17 September 2020. After which, the no. of cases started declining. However, the truth of India’s health services was revealed during this peak time. Most of the government hospitals in India were overburdened, unequipped, and understaffed. According to the various news reports, it has been found that UP, Bihar, Assam [30], Delhi [31], Tripura [32], Maharashtra [33], Karnataka [34], and Tamil Nadu [35] had faced a shortage of ventilators, ICU beds, and staff in hospitals. Apart from that, the healthcare infrastructure was highly unavailable for people suffering from other diseases. Overall, healthcare facilities have not been congruent to the size of the Indian population.

Table 3. State-wise data of active COVID-19 cases and availability of public and private hospitals, hospital beds, ICU beds, and ventilators.

State/Uts	Number of Hospitals		Number of Hospital Beds		Number of ICU Beds		Number of Ventilators	
	Public Sector	Private Sector	Public Sector	Private Sector	Public Sector	Private Sector	Public Sector	Private Sector
Maharashtra	711	2492	51,446	180,293	2572	9015	1286	4507
Andhra Pradesh	258	670	23,138	60,092	1157	3005	578	1502
Tamil Nadu	1217	1222	77,532	77,843	3877	3892	1938	1946
Karnataka	2842	7842	69,721	192,388	3486	9619	1743	4810
Uttar Pradesh	4635	12,468	76,260	205,142	3813	10,257	1907	5129
Delhi	109	67	24,383	15,072	1219	754	610	377
West Bengal	1566	697	78,566	34,969	3928	1748	1964	874
Bihar	1147	1887	11,664	19,193	583	960	292	480
Telangana	863	3247	20,983	78,936	1049	3947	525	1973
Assam	1226	503	17,142	7036	857	352	429	176
Odisha	1806	695	18,519	7131	926	357	463	178
Gujarat	438	970	20,172	44,690	1009	2234	504	1117
Rajasthan	2850	2794	47,054	46,122	2353	2306	1176	1153
Kerala	1280	2062	38,004	61,223	1900	3061	950	1531
Haryana	668	1480	11,240	24,901	562	1245	281	623
Madhya Pradesh	465	506	31,106	33,833	1555	1692	778	846
Punjab	682	1638	17,933	43,064	897	2153	448	1077
Jharkhand	555	809	10,784	15,712	539	786	270	393
Chhattisgarh	214	182	9412	8018	471	401	235	200
Jammu and Kashmir	143	14	7291	704	365	35	182	18
Uttarakhand	460	829	8512	15,331	426	767	213	383
Goa	43	22	3012	1572	151	79	75	39
Puducherry	14	6	3569	1603	178	80	89	40
Tripura	156	8	4429	238	221	12	111	6
Himachal Pradesh	801	235	12,399	3641	620	182	310	91
Manipur	30	8	1427	363	71	18	36	9
Chandigarh	9	4	3756	1875	188	94	94	47
Arunachal Pradesh	218	20	2404	220	120	11	60	6
Nagaland	36	13	1880	681	94	34	47	17
Andaman and Nicobar	30	6	1075	219	54	11	27	5
Ladakh	na	na	na	na	na	na	na	na
Meghalaya	157	28	4457	787	223	39	111	20
Dadra and Nagar Haveli and Daman and Diu	17	27	859	1332	43	67	21	33
Sikkim	33	8	1560	392	78	20	39	10
Mizoram	90	23	1997	499	100	25	50	12
Lakshadweep	9	4	300	126	15	6	8	3

Source: (i) the Central Bureau of Health Intelligence and The Centre for Disease Dynamics, Economics and Policy (CDDEP); (ii) National Health Profile, 2019, MoHF.

Given the massive size of the population, India still lacks medical facilities and health professionals. According to the WHO data on the density of medical doctors (per 10,000 population), most developing subregions, namely South Asia, Africa, and Southeast Asian countries, have fewer than 10 doctors per 10,000 populations [36]. Presently, India only has 8.57 doctors per 10,000 populations. It shows that India's doctor–patient ratio is less than the prescribed limit of 1:1000 by the WHO [25]. Given the current health crisis, there is a considerable shortage of medical professionals in India.

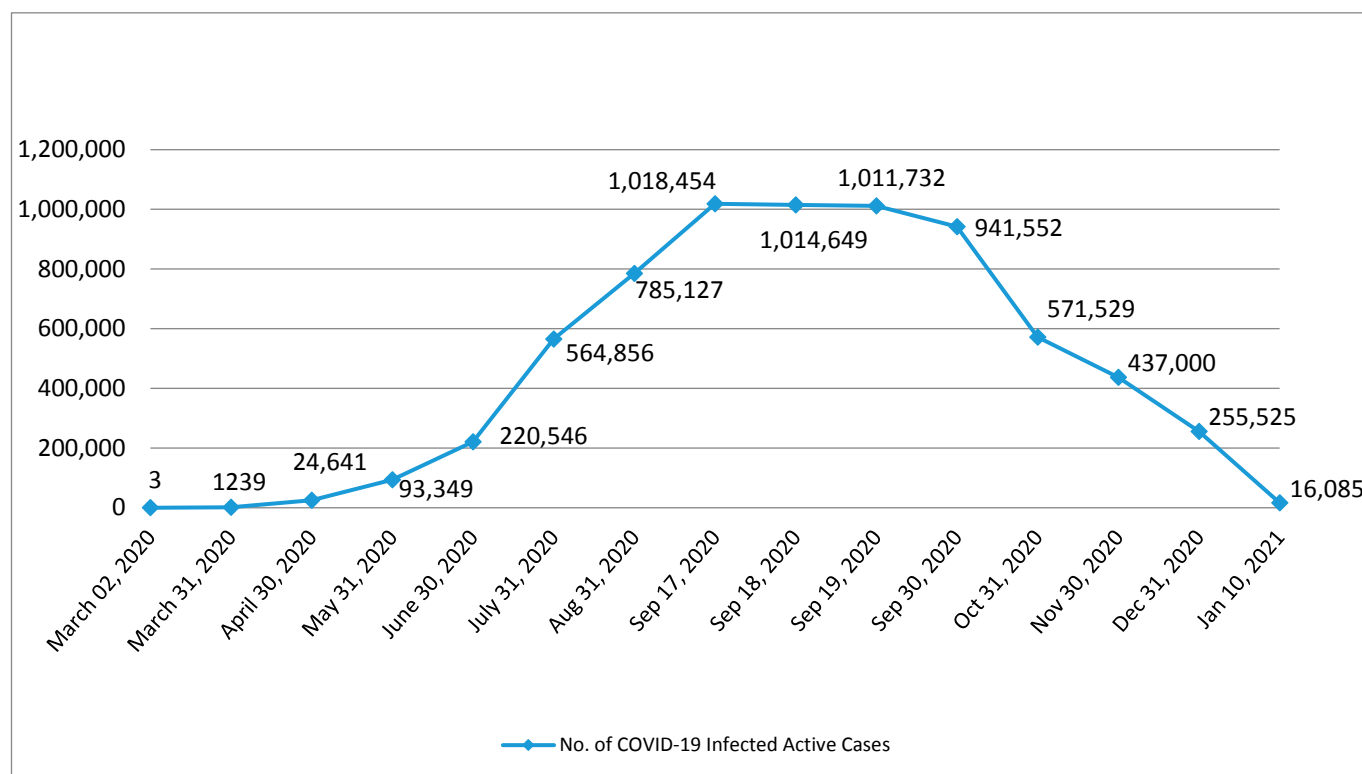


Figure 1. Number of COVID-19 active cases in India from March 2020–January 2021. Source: <https://www.worldometers.info/coronavirus/country/india/> (accessed on 12 January 2021).

India has a public–private partnership model in the healthcare sector, and in the current scenario, the same has been a critical component of its response to COVID-19. The central and all states/union territory (UT) governments of India have been taking various measures to control the outbreak of COVID-19 and providing adequate healthcare facilities for its people. Many hospitals and health professionals have been working all day and night long to serve the patients suffering from the deadly novel coronavirus. However, with the exponential rise of the COVID-19 cases, the Indian healthcare system had proved insufficient to accommodate the patients in government hospitals. In most of the states, the private sector is the more active healthcare system, but it has been found that the same system is charging a very high fee to treat COVID-19 patients in states such as Tamil Nadu, Delhi, Maharashtra, etc. For instance, in Kolkata, a businessman charged 1.5 million rupees for her mother's COVID-19 treatment [20]; A patient was charged with 178,000 rupees for a 10-day treatment in Bengaluru [37]; In Mumbai, the hospitals were charging 1 lakh rupees for N95 masks and PPE kits apart from the fees of the treatment [38]. The rapidly increasing number of coronavirus cases and exorbitant expenditure rates of private hospitals made it clear that India's available public health infrastructures cannot adequately meet the ongoing health emergency needs. India has nearly twice private hospitals than the public ones—an approximate 43,487 versus 25,778—despite about 85.9 percent of India's rural population and 80.9 percent of its urban population having no health insurance [20]. COVID-19 has exposed the shortage of government investment in healthcare, such as medical staff and

infrastructure facilities. As Kakar (2020), a public health researcher with the People's Health Movement in New Delhi, also pointed out that "Existing vacancies have not been fulfilled, even as government-run hospitals struggle without adequate manpower" [39]. Hence, it can be said that the lack of government investment in healthcare infrastructure in public hospitals has crippled India's coronavirus response. Therefore, to fill this gap and contain the spread of the pandemic, the GOI has taken some measures, such as a lockdown. As a curative measure, the Indian government expanded its investment to ramp up the country's healthcare infrastructure.

3.5. Government of India's Combative Measures against COVID-19

In all of the early coronavirus cases, it was found that India's infected cases came exclusively from China, United Arab Emirates (UAE), Italy, and the UK. The GOI has been trying vigorously to prevent the community transmission of COVID-19 by adopting various measures and strategies, such as lockdown, social distancing, early detection, tracking and tracking contacts, quarantine, and isolation, etc. Realizing the gravity of the situation, the GOI has taken several measures to combat the COVID-19.

3.5.1. Lockdown

The lockdown is the most preventive and creditable measure to stop the spread of novel coronaviruses by the GOI. While addressing the nation on 24 March, PM Narendra Modi had announced the nationwide lockdown for 21 days from 25 March 2020. Before the announcement, several preventive measures were put in place, including the travel restrictions (national and international), closure of educational establishments, gyms, museums, theatres, banning of mass social, religious, political ceremonies, etc. [40]. However, given the pandemic's emergency state, the GOI had decided to extend the lockdown till 31 May 2020 in a phased manner. On 4 April, the GOI had extended the lockdown to 3 May 2020. Lockdown 3.0 was announced by the GOI to further extend the same until 17 May with some relaxations provided by the state governments, respectively. The pandemic affected areas were divided into three zones, namely green zone, orange zone, and red zone, where the red zone falls under the category of most affected and, therefore, has strict regulations. The GOI has identified approximately 319 districts in the green zones, 284 districts in the orange zones, and 130 districts in the red zone [41]. On 12 May 2020, the lockdown was further extended from 17 May to 31 May with the new guidelines for lockdown 4.0. In lockdown 4.0, the Ministry of Home Affairs (MHA) has allowed the salon shops, barbershops, shopping complexes, sports complexes, except in the containment zones, to be opened from 18 May 2020 with staggered timings.

In June, the MHA had released the fresh guidelines stating that the reopening phases will "have an economic orientation" [42]. Lockdown restrictions have been continued in containment zones, while operations would be permitted in other regions in a phased manner. This first reopening phase was called "unlock 1" and was allowed to reopen shopping malls, religious sites, hotels, and restaurants from 8 June [42]. Large social and political ceremonies/activities were still forbidden, but the inter-state travel ban was lifted. Night curfew was, however, in effect from 9 PM to 5 AM. Concomitantly, the GOI had authorized the states to place necessary restrictions on all social, religious, and political activities [43]. On 1 July, the GOI had announced new guidelines for "unlock 2.0", which started from 1 July that includes the opening of training institutes, no restrictions on inter-state and intra-state movements of persons and goods (except in containment zones), night curfew relaxation, etc. [43]. In the subsequent months, GOI has issued guidelines for unlock 3 and 4; however, the ban continues on large gatherings.

3.5.2. Economic Packages

COVID-19, as a major global health crisis, had left indelible imprints on various sectors, including the economy. Therefore, for boosting the economy and industrial sectors, strengthening the country's health infrastructure, and for the treatment of COVID-19-

infected people, the GOI has provided a financial package of Rs 15,000 crore [40,44]. The fund's value is equal to 0.1 percent of India's GDP, and it was devoted to improving the health facilities, including testing facilities for COVID-19, isolation beds, PPE, ICU beds, ventilators, etc. Additionally, India's finance minister has announced a stimulus package of 1.7 lakh crore valued at approximately 0.8 percent of GDP. The key elements of the package included the provision of food, cooking gas, and cash transfers to the lower-income households; wage support to low-wage workers; insurance coverage for workers in the healthcare sector [45]. Later, keeping in mind the need for a dedicated national fund with the primary objective of coping with any kind of emergency or disaster situation (such as COVID-19), a public charitable trust was formed under the name "PM CARES, i.e., Prime Minister's Citizen Assistance and Relief in Emergency Situation Fund" [46]. The GOI also has declared the economic package worth Rs. 2,097,053 crores under the scheme of "Atma-Nirbhar Bharat" (self-reliant India) as a post-pandemic economy plan aimed at helping the economy to recover from the devastation caused by COVID-19 [47].

3.5.3. The National Task Force for COVID-19

The Indian Council of Medical Research (ICMR) has constituted a national task force (NTF) for COVID-19 to effectively and systematically contribute to the ongoing pandemic's scientific and technical responsibility. As per the Hindustan Times report (7 April 2020) [48], the main objectives of NTF are to immediately initiate the research studies and identify research priorities for clinical research, diagnostics, and biomarkers, epidemiology, and surveillance, and vaccines and drug development. The ICMR also has nominated members for each group under the task force and also decided terms of reference for the members that include review evidence, identifying research priorities, align with the level of outbreak and response, identify and create a protocol, develop notes and identify partners for implementation [48]. To combat COVID19 scientifically, India's government is consulting and involving epidemiologists at all levels of policymaking.

3.5.4. COVID-19 Protective Kits

Personal protective equipment (PPEs) is a protective device designed to protect the workers' health by reducing exposure to biological agents. The PPE kits include goggles, face-shields, gloves, masks, gowns/coverall (with or without aprons), shoe cover, head-covers, and the frontline workers, i.e., doctors and healthcare workers, who have been engaged in the service of COVID-19 patients. In the initial days of the coronavirus outbreak, India has imported PPE kits from various countries like Singapore (1 million), South Korea (2 million), and China. India has imported nearly 17 lakh kits from China on 5 April, out of which 50,000 kits had failed the quality test based on the Indian standards [49].

Against the backdrop of the poor quality of imported PPEs, India has started producing and manufacturing the same. Currently, India has become the world's second-largest PPE kit manufacturer in just two months, with an average production of 1.7 lakh PPE kits per day [50]. In addition, India wants to become an exporter of PPE kits as soon as the domestic demand would be completely met. This initiative results from joint efforts made by the various government institutes like the Defense Research Development Organization (DRDO), the Ministry of Textiles, along some private manufactures. Until 22 May, the GOI has provided 65 lakh PPE coveralls and 101.07 lakh N95 masks to the states [51]. The MoHFW also has issued guidelines regarding the type of PPEs used in the different settings for healthcare workers and others, working in quarantine centers, hospitals, laboratory, and primary healthcare/community settings [52]. In addition, hospitals are needed to train their staff to ensure the proper waste management of used health equipment.

3.5.5. Medicines and Vaccines

As the novel coronavirus continues to play havoc with lives and livelihoods worldwide, scientists have been making efforts to find a vaccine that could combat the ugly head of the coronavirus. India is a world-leading manufacturer of vaccines and generic drugs.

Several research institutes in India have been working on separate programs to find a coronavirus vaccine. Since the pandemic outbreak, India has been insisting on a coordinated global solution to combat the pandemic. India has already supplied 133 countries with 446 million hydroxychloroquine tablets and 1.54 billion paracetamol tablets, attracting appreciation from many world leaders [53]. India's Foreign Secretary Harsh Vardhan Shringla also has said that the coronavirus pandemic reaffirmed India's position as a "world pharmacy" [54]. Pharmaceutical companies like Glenmark, Hetero Drugs and Cipla have launched five antiviral drugs, namely the "FabiFlu, Covifor, Cipremi, Tocilizumab, and Itolizumab" that can help in treating mild to moderate COVID-19 patients [55,56]. The Indian Central Drugs Standard Control Organization (CDSCO) has approved the use of the Glenmark Pharmaceuticals generic for the treatment of COVID-19 patients for the respective generics of Favipiravir and Cipla and Hetero Drugs for Remdesivir [57].

A vaccine called "Covaxin" was developed by Hyderabad-based Bharat Biotech in association with ICMR. Approval has already been concurring by the Drug Controller General of India (DCGI) for phase I and II human clinical trials scheduled to start across the country. Covaxin is an inactivated vaccine developed from an infectious SARS-CoV-2 virus strain, which has shown promise in preclinical research, shown extensive safety and effective immune responses [58]. The GOI has authorized the Covaxin and Covishield vaccine made by the Serum Institute of India in partnership with British pharmaceutical company AstraZeneca to roll out the vaccination process. India is expected to begin its vaccination program from mid-January of 2021 with the aim to reach 300 million people by early august [59]. In addition, in the initial days of the coronavirus outbreak in India, the Ministry of AYUSH (Ayurveda, Yoga and Naturopathy, Unani, Siddha, and Homeopathy) recommended some immunity-boosting measures, particularly for respiratory health that includes intake of warm water and "kadha," use of Ayurveda herbs in cooking, and doing Yoga [60]. However, it is only an immunity-boosting remedy and does not claim to be a treatment for COVID-19.

GOI's steps amidst the COVID-19 pandemic times can be considered curative measures that were necessary and were the need of the hour. However, India lacks the required healthcare infrastructure that is direly needed during this time. The national health policies are formed to prevent and protect citizens and be prepared for any health emergencies. However, despite many steps taken by the Indian government to tackle the situation, the pitfalls of NHP-17 become clearly visible in the context of the COVID-19 pandemic.

4. Discussion

4.1. National Health Policy-2017: Its Paradoxes

Health security is the fundamental right in India under Article 21 of the constitution that deals with the "right to life"; however, healthcare expenditure in India is one of the lowest in the world. The severity of the situation can be best understood by the fact, according to the WHO Expenditure Database 2016, India ranks 170 out of 188 countries in domestic general government spending on health as a percentage of GDP [61]. Although the post-liberalized Indian economy has been growing exponentially, healthcare investment is hovering around 1.6 percent of GDP in the financial year 2020 [62]. Though the NHP-17 is primarily aligned with UN SDGs, however, due to low expenditure on the health budget, India can still not meet the set SDGs targets, which ensure "healthy living and well-being for all".

India's health expenditure includes the established expenditure comprising of salaries, gross budgetary support to various institutions and hospitals, and transfers to states under centrally sponsored schemes, such as "Ayushman Bharat" set under NHP 2017 [63]. The health policy of 2017 has set its objective to "improve health status through concerted policy action in all sectors and to expand preventive, promotive, curative, palliative and rehabilitative services provided through the public health sector with a focus on quality" [63]. Now, the question is how the government would achieve these lofty objectives with a mere expenditure of 2.5 percent of GDP and also without the additional methods of

funding as the preferred method of funding healthcare is still limited to the way of general taxation [63]. Moreover, the policy paves the way for reducing public health systems, thus, reducing the role of the government in the delivery of health services and promoting the private sector's supremacy in curative care [64]. Similarly, the Ayushman Bharat scheme also has been proving public funds for private benefits because this policy ensures a publicly funded and privately managed health insurance scheme. Though the objective of the scheme is universal health coverage as recommended by NHP-2017. Still, it does not cover the entire population and does not cover all health expenditures resulting from various morbidity rates, mostly the communicable kind [65]. Under PMJAY, the states that have registered the most hospitalizations are Rajasthan, Gujarat, Jharkhand, Chhattisgarh, and Kerala. However, the irony is that admissions in private hospitals were higher than those in public hospitals. The numbers of hospitals registered/empaneled under the private sector scheme are also higher than in the public sector [65]. The key argument against the PMJAY model is that government funds are being used to subsidize the private health sector, where healthcare expenditures are nearly double or even three times in public hospitals. Hence, the cases of fraudulent expenditure claims have been increasing in private hospitals [66,67]. Moreover, as the poor people in India are mostly illiterate/uneducated, it is highly difficult for them to understand the process of insurance claims for the government's respective illnesses, which consequently led to fraudulent practices by the private hospitals.

While terms, such as cooperative federalism are often used in the policy document, the scheme makes it almost compulsory for state governments to "cover" eligible beneficiaries as specified/identified in the socioeconomic caste census (SECC 2011), which naturally diverts funds allocated to building healthcare infrastructure/policy within the state. Although, amid COVID-19 pandemic times, 41,000 Ayushman Bharat Centers have been providing healthcare services to 8.8 crore people. However, Ayushman Bharat beneficiaries chose private hospitals for their COVID-19 treatments due to less trust in the governmental health facilities [68]. During the lockdown, the number of active hospitals fell short by almost 40 percent in both public and private sectors. According to the report presented by NHA (2020), which assessed the impact of COVID-19 on PMJAY, the decline in hospital operations in private hospitals given the apprehension of contracting COVID-19 infection among the hospital owners and staff or fear of being stigmatized and losing business if they were to treat patients with COVID-19. At the same time, due to overseeing most COVID-19 treatments, reductions in public hospitals can be due to insufficient staff and resources. In this context, the healthcare facilities have proved insufficient to meet the coronavirus-infected cases' requirement. Most of India's government hospitals are overburdened, understaffed, and unequipped.

Notwithstanding the NHP 2017, the private healthcare system's cooperation is sought, but the same had not come forwarded to extend its support. Most of the private hospitals have been closed. The infected patients were denied admissions. As healthcare is a state subject, healthcare outcomes have remained divergent based on state administration quality. While the Northern part of India is the most populous area, it has one of the country's most inadequate healthcare infrastructures. Given the privately controlled health infrastructures, India's health system is not universalistic to deal with the pandemic situation. The current situation of Indian healthcare shows that it has been paralyzed. Although central and state governments had taken several measures to deal with the pandemic, these measures remained inadequate given the lack of healthcare infrastructures. India's national health policy had already been implemented in 2017; still, it is unprepared to deal with a health emergency like COVID-19, and a lot is to be done to achieve the set targets of the NHP 17.

4.2. Health Policy Options for India

Under the NHP 2017, several steps have been taken by the GOI to create the universalization of healthcare facilities. However, the outbreak of the COVID-19 proved that the healthcare system is not adequate/suitable for emergency kind of situations like COVID-19. The healthcare system is still haunting medical professionals' inadequacy like

doctors, nurses, paramedics, especially in the public sector. The availability of healthcare infrastructure is still not congruent to the size of the population.

India is a developing country where the financial situation is not much good to deal with the outbreak of COVID-19 than the US, China, UK, Russia [69], and other developed countries. Therefore, India needs to focus on the efficient development of robust health infrastructure to counter any health crisis in the coming times. This sort of corona-attributable macroeconomic vulnerability has been recently exposed in rich OECD nations with substantially higher per capita health spending [70]. Health is undoubtedly one of the most important dimensions of human life. Hence, the GOI needs to increase its healthcare expenditure by at least 5–10 percent of GDP. Here the stakes remain high given India's huge double burden of acute infectious and chronic noncommunicable diseases [71] similar to the other developing nations in Africa [72]. In addition, the COVID-19 pandemic has shown that privatization of healthcare is not a suitable solution for India. The government should regulate the functioning and expenditures charged by the private hospitals. The NHP 2017 may be redesigned to focus more on public healthcare than relying on the private healthcare sector. During the COVID-19 time, private hospitals have not performed according to the requirements of the situation. Moreover, the NHP-2017 and Ayushman Bharat scheme emphasized curative care, while the focus should be more on preventive and promotive services. India needs to spend more on R&D in order to provide world-class healthcare facilities to its citizens.

Until now, the community-based strategy has not been put in place to deal with the COVID-19. The community-based resources like the volunteer groups and elected local authorities could be used for mass testing, isolation, and creating public awareness. Panchayats in Kerala and Odisha are the best examples of community-based response organizers. At the same time, Andhra Pradesh has deployed village and ward volunteers for symptom-based rural and urban household syndrome monitoring and contact tracing [73]. In addition, the local authorities can mobilize their efforts for mental health awareness campaigns through mass media, community leaders, local influencers, and volunteers. Considering India's population and the increasing number of COVID-19 cases, a high degree of action, planning, and management are required. The GOI can motivate all the state governments/local authorities to replicate and extend these models throughout India.

Some states in India had effectively contained the cluster of infected people in their region and shown some unique regional models, such as the Agra model (Uttar Pradesh), the Bhilwara model (Rajasthan), and the Pathanamthitta model (Kerala); each was representing Indian states from the north, west, and south, respectively. The common measures in all the three models include imposing a curfew in the districts, which also barred essential services, house-to-house surveys, and extensive screening to check for possible cases, monitor the conditions of those under home quarantine daily through app along keeping a tab on them through geographical information system (GIS), detailed contact tracing of each positive cases to create a record of everybody with whom infected people met, and door-to-door delivery of essential services to ensure strict lockdown rules. Shashi Tharoor (the former UN diplomat) argued that these innovative regional models are the "power of example" and could also lead other nations with limited infrastructure [74]. Early diagnosis, effective treatment and preventive measures form the cornerstones in disease containment thereby reducing its rapid spread, high morbidity and economic impact on the health systems [75]. Undoubtedly, some of the states in India did very well in containing the spread of COVID-19. However, in the long run, the GOI needs to focus on reshaping the health policy to make India well-prepared for health emergencies like COVID-19.

5. Conclusions

COVID-19 can be characterized as a global health crisis leaving multidimensional implications on all facets of life like health, including economy, education, etc., for the entire globe, including India. Realizing the severity of the situation, the GOI had taken several curative measures like lockdown, quarantine, social distancing, etc., to combat the

COVID-19. However, the outbreak of COVID-19 has emerged as an eye-opener and reality check of the healthcare system created under the NHP 2017. The inadequate availability of medical professionals, i.e., doctors, nurses, and paramedics still one of the critical issues in general and particularly for the public healthcare system. The adequate availability of public healthcare infrastructures, particularly in hospitals, primary and community health centers, beds, ICUs, ventilators, etc., still has not been congruent to the size of the country's population. The expenditure percentage of GDP on public health has not been reached the set target under the NHP 2017. The most critical observation during the COVID-19 was the private health sectors' passivity towards the COVID-19 patients, which is one of the important concerns for the NHP 2017.

The NHP 2017 still must do a lot to meet the doctor–patient ratio as per the prescribed limit. The current challenges are a considerable shortage of medical professionals, low health budget, SDGs healthcare targets like “healthy living and well-being for all; universal health coverage, not covering the entire population. During the pandemic, higher admissions have taken place in private hospitals than in public hospitals. Higher numbers of private hospitals have been empaneled on board than public hospitals. Moreover, less trust of the people in the public hospitals given the lack of healthcare facilities and consequently decline in operations given the apprehension of contracting COVID-19 infection had highlighted the weakness of the public health policy.

In this background, India needs to expand the public healthcare system and enhance the expenditure as per the set goals in NHP-17 and WHO standards. The private healthcare system has not been proved reliable during the emergency. Only the public health system is suitable for the country wherein the population's substantial size is rural and poor. Therefore, the public health policy is needed to revisit to make it truly public in nature by enhancing the healthcare budget; improving patients' ratio: doctors, hospitals, beds, ICUs, ventilators, etc. Only the public health system can come to the rescue, requiring long-term planning and an adequate budget. Preaching needs to be followed by practice!!

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